

Yaakov (Kobi) Benenson

Born October 25, 1975
Nationality Israeli
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Education

2005 Doctor of Philosophy, Departments of Computer Science & Applied Mathematics and Biological Chemistry, Weizmann Institute of Science, Israel.
Advisor: Ehud Shapiro.
Dissertation: "Molecular computing devices"

1999 Master of Science, Department of Chemistry, Technion – Israel Institute of Technology.
Advisor: Timor Baasov.
Thesis: "Towards carbohydrate-based catalytic systems"

1996 Bachelor of Arts (summa cum laude), Department of Chemistry, Technion – Israel Institute of Technology

Honors and Scholarships

2005 Kennedy Prize awarded by the Feinberg Graduate School for achievements in Ph.D. research

2005 Rothschild fellowship (declined)

2005 Wolf foundation prize for excellence in Ph.D. research

2004 Elected to the TR100: *Technology Review* list of the 100 world's top young innovators

2004 Feinberg Graduate School List of Honor (Weizmann Institute)

1998 Wolf foundation prize for excellence in graduate studies

1993-1996 Member of the Technion special program for exceptionally gifted students

Academic appointments

2005-now Bauer Fellow, FAS Center for Systems Biology, Harvard University

Academic activities

March 2007 Teaching a course on molecular computing at the Polytechnic University in Madrid, Spain

2006/7 Program Committee Member. The 13th International Meeting on DNA-Based Computers

2005 Program Committee Member. 3rd International Conference on Computational Intelligence, Robotics and Autonomous Systems

2005/6 Program Committee Member. The 12th International Meeting on DNA-Based Computers

2004/5 Program Committee Member. The 11th International Meeting on DNA-Based Computers

2004/5 Member of the High Level Expert Group on Synthetic Biology, Research Directorate-General, the European Commission (EU)

Grants

2006-8 NIGMS Harvard Center for Modular Biology.
Subproject co-PI's: Y. Benenson and G. Church.
Title: Synthetic implementation of biological control modules.
Funding: \$188K/year

Refereed publications

1. Rinaudo, K., Bleris, L., Maddamsetti, R., Subramanian, S., Weiss, R. & Benenson, Y. A universal RNAi-based logic evaluator that operates in mammalian cells. *Nature Biotechnology*, AOP May 21, 2007.
<http://dx.doi.org/10.1038/nbt1307>
2. Adar, R., Benenson, Y., Linshiz, G., Rosner, A., Tishbi, N. & Shapiro, E. Stochastic computing with biomolecular automata, *Proc. Natl. Acad. Sci. USA* **101**, 9960-9965 (2004).
3. Benenson, Y., Gil, B., Ben-Dor, U., Adar, R. & Shapiro, E. An autonomous molecular computer for logical control of gene expression. *Nature* **429**, 423-429 (2004). **N&V** on p. 351 of the same issue.

4. Benenson, Y., Adar, R.; Paz-Elizur, T., Livneh, Z. & Shapiro, E. DNA molecule provides a computing machine with both data and fuel. *Proc. Natl. Acad. Sci. USA*, **100**, 2191-2196 (2003).
5. Benenson, Y., Paz-Elizur, T., Adar, R., Keinan, E., Livneh, Z. & Shapiro, E. Programmable and autonomous computing machine made of biomolecules. *Nature* **414**, 430-434 (2001).
6. Liang, P.H., Lewis, J., Anderson, K.S., Kohen, A., D'Souza, W., Benenson, Y. & Baasov, T. Catalytic mechanism of Kdo8P synthase: Transient kinetic studies and evaluation of a putative reaction intermediate. *Biochemistry* **37**, 16390-16399 (1998).
7. D'Souza, W., Benenson, Y. & Baasov, T. Catalytic mechanism of Kdo8P synthase: Synthesis and evaluation of a putative reaction intermediate. *Bioorg. Med. Chem. Lett.* **7**, 2457-2462 (1997).
8. Benenson, Y., Belakhov, V. & Baasov, T. 1-(dihydroxyphosphynyl)vinyl phosphate: The phosphonate analogue of phosphoenolpyruvate is a pH-dependent substrate of Kdo8P synthase. *Bioorg. Med. Chem. Lett.* **6**, 2901-2906 (1996).

Invited reviews

1. Benenson, Y. Molecular automata: from concepts to applications. Submitted to *Cell. Mol. Life Sci.*
2. Shapiro, E. & Benenson, Y. Bringing DNA computers to life. *Sci. Amer.* **294**, 44-51 (2006).
3. Benenson, Y. & Shapiro, E. Molecular computing machines. In *Dekker Encyclopedia of Nanoscience and Nanotechnology*, James A. Schwarz, Cristian I. Contescu, and Karol Putyera, Eds.; Marcel Dekker, Inc.: New York, 2004; pp 2043-2056.

Invited talks

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| August 2007 | 9 th Functional Genomics meeting on Synthetic Biology,
Göteborg University, Sweden |
| June 2007 | CiE'07: Computability in Europe, Siena, Italy |
| April 2007 | Center for Cancer Systems Biology Seminar Series, Dana-Farber
Cancer Institute, Boston MA |
| February 2007 | The General Dynamics Distinguished Lecture Series, University
of Michigan, Ann Arbor |
| December 2006 | Evolving Life- Life Evolving symposium, Namur, Belgium

GTCbio's 2nd Modern Drug Discovery & Development Summit,
Philadelphia, USA |

- May 2006 NanoBusiness 2006, NYC, USA
- Meeting of the Center for Molecular Cybernetics, Ann Arbor, USA
- February 2005 The 4th Congress of the Federation of the Israeli Societies for Experimental Biology, Eilat, Israel
- January 2005 Mathematics-Biology Encounters Workshop, Louis Pasteur University, Strasbourg, France
- December 2004 4th Mediterranean Meeting on Laboratory Medicine, Italian Society of Clinical Biochemistry, Bari, Italy
- July 2004 Departmental Colloquium, Department of Chemistry, Technion – Israel Institute of Technology, Haifa, Israel
- June 2004 Information Science and Technology Seminars, Caltech - California Institute of Technology, Pasadena, USA
- June 2004 The 10th International Meeting on DNA-Based Computers. Milan, Italy
- October 2002 Nanobionics II: From Molecules to Applications. Marburg University, Marburg, Germany
- December 2000 The 14th Annual Meeting of the Israel Society for the Study of the Origin of Life, Rehovot, Israel

Other presentations

- June 2004 Poster presentation, The 1st International Meeting on Synthetic Biology. MIT, Boston, USA
- June 2002 Speaker, The 8th International Conference on DNA Based Computers, Sapporo University, Sapporo, Japan,
- June 2001 Poster presentation, The 7th International Conference on DNA Based Computers, Tampa University, Tampa, USA.